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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,856	03/22/2001	Masayuki Orihashi	P20798	3437
7055	7590	04/13/2005	EXAMINER	
GREENBLUM & BERNSTEIN, P.L.C.			DEPPE, BETSY LEE	
1950 ROLAND CLARKE PLACE			ART UNIT	
RESTON, VA 20191			PAPER NUMBER	

2637

DATE MAILED: 04/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/813,856

Applicant(s)

ORIHASHI ET AL.

Examiner

Betsy L. Deppe

Art Unit

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2005 and 23 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4 and 8-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,8-14 and 16-20 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Based on the amendment to claims 1-5, 10 and 18, the objections to these claims are withdrawn. Furthermore, the amendment to claim 11 overcomes the rejection of claims 11, 12, 15 and 16 in the final Office Action mailed October 27, 2004. The rejections of claims 8-10, 13, 14, 17 based on Tanaka et al. (US Patent 4,800,574) is withdrawn in view of the amendments. However, upon further consideration, a new ground(s) of rejection is made in view of Tol et al. (US Patent No. 4,746,902) and Baier et al. (US Patent No. 5,375,255 cited in the Office Action mailed May 13, 2004).

Drawings

2. The drawings are objected to because Figure 13 includes a typographical error in element "104". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date

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of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. The following claims are objected to because of the following informalities:
 - a. in claims 9-11, the Examiner suggests changing "received signal that has been converted into a non-linear signal by the quantizer" on lines 3-4 of the respective claims to "non-linear quantized signal" (see claim 13, line 4) for improved readability and clarification;
 - b. in claim 17, the Examiner suggests deleting "on which the reception processing is performed" on lines 2-3 for improved readability and clarification;
and
 - c. in claim 19, line 12, there should be an "and" after the semi-colon.Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not describe an apparatus comprised of a distortion converter with a linear compensator, as recited in claim 13, lines 6-12 and a distortion corrector comprised of a distortion compensator, as recited in claim 14, lines 5-7. The detailed description describes either a linear compensator (for example, see Figures 9 and 12-14) or the recited distortion compensator (for example, see Figures 4, 5, and 7). Therefore, it is unclear how the apparatus used both the linear compensator and the distortion corrector. It appears that "the distortion corrector" in claim 14, lines 4-5 should be "the linear compensator."

7. Claims 8-10 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claims 8 and 14 recite the limitation "the distortion corrector" in lines 2 and 4-5, respectively. There is insufficient antecedent basis for this limitation in the respective claims. It appears that "the distortion corrector" should be "the linear compensator." As dependent claims from claim 8, claims 9 and 10 are rejected under the same grounds.

9. In claim 8, the recited limitation is vague and indefinite. Since the "processed received signal" is the result of the reception processing, it is unclear how the reception processing is performed on the "processed received signal." As dependent claims from claim 8, claims 9 and 10 are rejected under the same grounds.

Claim Rejections - 35 USC § 102

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. Claims 1, 3, 4, and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Baier et al. (US Patent No. 5,375,255 cited in the Office Action mailed May 13, 2004).

12. With regard to claim 1, Figures 2 and 3b of Baier et al. disclose the claimed invention including a receiver (2) with a quadrature demodulator (23) and a distortion corrector (30) wherein the distortion corrector comprises a distortion estimator (TABLE in Figure 3b) and plural distortion compensators (see the multipliers in Figure 3B) wherein the in-phase and quadrature signals are input to the distortion estimator and a respective distortion compensator. Figure 3b shows distortion estimator T generating a correcting signal that is utilized by the distortion compensators to remove the non-linear distortion. (See column 3, line 56 - column 4, line 44; column 5, lines 60-65; and column 6, lines 30-38) Baier et al. also teaches that the correcting signal is indicative of the inverse characteristic of the processed received signal. (See column 4, lines 34-37)

13. With regard to claim 3, Figure 2 of Baier et al. discloses the claimed invention including the receiver comprised of a filter calculator that limits a frequency band of the received signal (20 and 21). (See column 4, lines 4-6)

14. With regard to claim 4, Figure 2 of Baier et al. discloses the claimed invention including the receiver comprised of an adjuster that adjusts an amplitude of the received signal (22). (See column 4, lines 6-16)

15. With regard to claim 18, Baier et al. discloses the claimed invention including performing reception processing on an instantaneous signal. Since the analog receiving section (2) uses only the currently received signal, it is implicit that the received signal comprises an instantaneous signal.

16. With regard to claim 19, Figures 2 and 3b of Baier et al. disclose the claimed invention including initially processing a received signal to produce an in-phase signal and a quadrature signal ("2" in Figure 2); estimating a non-linear distortion introduced by initial processing and generating a correcting signal based on an inverse distortion characteristic (TABLE in Figure 3b); and multiplying the correcting signal with each respective in-phase signal and a quadrature signal to remove the non-linear distortion (multipliers in Figure 3b) from the in-phase signal and a quadrature signal; and demodulating the multiplied in-phase signal and a quadrature signal (I_{ex} and Q_{ex}). (See Figure 2; column 3, line 56 - column 4, line 44; column 5, lines 60-65; and column 6, lines 30-38) Although the demodulating step is not explicitly shown in Figures 2 and 3b, Baier et al. implicitly teaches demodulating/decoding the multiplied received signal. (See column 1, lines 32-35 and column 5, lines 40-45)

17. With regard to claim 20, Figure 2 of Baier et al. discloses the claimed invention including initial processing comprising at least one of amplifying (22), quantizing (25) and quadrature demodulating (23).

18. Claims 8 and 13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Henrion (US Patent No. 5,594,612).

19. With regard to claim 13, Figure 12a of Henrion discloses the claimed invention including a receiver comprising a non-linear quantizer (201) and distortion converter with a linear compensator (210 and 211) which determines a correcting signal (a') which is used by the linear compensator to convert the non-linear quantized signal to a linear signal (217). (See also column 19, lines 27-50)

20. With regard to claim 8, Henrion discloses the claimed invention. It is inherent/implicit that a quantization characteristic of the quantizer is used to correct the distortion. Since the distortion results from the quantizer, the quantization characteristic of the quantizer must be used to accurately compensate for the distortion.

Claim Rejections - 35 USC § 103

21. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

22. Claims 8, 10, 11, 13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tol et al. (US Patent No. 4,746,902) in view of Baier et al.

23. With regards to claims 13 and 17, Figure 1a of Tol et al. discloses the claimed invention including a receiver comprising a non-linear quantizer (2 in Figure 1a) and a distortion converter (3, 4 and 5 in Figure 1a) that converts the non-linear quantized signal to a linear signal wherein the distortion converter comprises a linear compensator (3 and 4 in Figure 1a) that determines a correcting signal and the correcting signal is used by the linear compensator to convert the non-linear quantized signal to a linear signal. Furthermore, it is implicit that the received signal comprises an instantaneous signal. However, Tol et al. does not teach that the linear signal is for demodulation.

Since the circuit in Tol et al. compensates for the non-linear distortion in an A/D converter and Baier et al. teaches using an A/D converter in a demodulator (see Baier et al., column 1, lines 32-35), it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the circuit taught by Tol et al. in the digital processing section 30 of Baier et al. in order to provide good linearity at a comparatively low cost. (See Tol et al., col. 1. lines 41-44)

24. With regard to claim 8, Tol et al. in view of Baier et al. discloses the claimed invention including using a quantization characteristic of the quantizer. (See Tol et al., "3" in Figure 1a)

25. With regard to claim 10, Tol et al. in view of Baier et al. discloses the claimed invention including a calculator. (See Tol et al., "5" in Figure 1a)

26. With regard to claims 11 and 16, Tol et al. in view of Baier et al. discloses the claimed invention including converting the non-linear signal into a signal represented by a code related to at least one characteristic of the received signal. (See Tol et al., "3" in

Figure 1a) Furthermore, it is inherent that 3, 4 and 5 in Tol et al. performs digital signal processing since the output of the quantizer (7) that is provided to "3" and "5" is a digital signal.

27. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tol et al. in view of Baier et al., as applied to claim 11 above, and further in view of Maru (US Patent No. 6,553,084 B1) Tol et. al. in view of Baier et al. disclose the claimed invention except for performing reception processing based on a control signal in a demodulated linear signal.

Maru discloses performing reception processing based on a control signal in a demodulated linear signal. (See Figure 1) It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the teaching of Maru into the apparatus disclosed by Tol et al. in view of Baier et al. in order to ensure that the receiver is operating in the optimum range.

Allowable Subject Matter


28. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betsy L. Deppe whose telephone number is (571) 272-3054. The examiner can normally be reached on Monday, Wednesday and Thursday (8:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272 - 2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Betsy L. Deppe
Primary Examiner
Art Unit 2637